

FARM POVERTY AND SAFETY NETS

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Farm families with incomes below the poverty line are far less likely than wealthier farmers to receive farm support payments. Using data from the 1989–2004 Current Population Survey, we find that poor farm families are also not participating in other assistance programs. Controlling for other factors, eligible farm families have substantially lower participation rates in the Food Stamp Program and in Medicaid than eligible nonfarm families. Removing farm safety net program payments would increase the number of farmers eligible for these programs but, in the absence of behavioral changes, would only lead to small increases in the number of recipients.

Key words: farm safety net programs, food stamps, Medicaid, poverty.

The genesis of a strong federal presence in agricultural commodity markets was the persistence and pervasiveness of rural poverty. In 1930, 44% of Americans lived in rural areas, and 30 million of these 54 million people lived on farms (U.S. Department of Commerce 1933). Farm household income was less than half that for nonfarm households (U.S. Department of Commerce 1975). The high percentage of Americans in farming and their low average incomes presented an important challenge to achieving national prosperity. In response, as part of the New Deal, the federal government established a series of farm safety net programs.

Today average farm household income is on par, and in some years exceeds, that of nonfarm households (Gardner). The availability of remunerative off-farm employment coupled with on-farm gains in labor productivity has improved the well-being of farm families, who are fewer in number than in the 1930s, yet better off. Despite these gains for average farmers, about one in ten farm households has income below the poverty line. In comparison to nonpoor farm households, these low-income

farm households are more likely to be headed by someone over the age of sixty-five years and by someone with less than a high school degree (Gundersen et al., table 2).

In the past, these poor farmers may have benefited from farm safety net programs. Though these programs are still often characterized as providing a safety net for agriculture, larger farms receive most payments because the distribution of benefits is still tied, as it was in the 1930s, to volume of production. For example, about 20% of the poorest group of farmers (limited resource farmers) receive support payments, while about 75% of the most well-off farmers receive farm payments. And there is a gap in the payment levels as well: the average limited resource farm in 1997 received \$2,183 while the average very large family farm received \$32,087 (Gundersen et al.).¹

But low-income farmers need not only rely on the farm safety net to maintain a minimum standard of living; they can also access other safety net programs including safety net programs designed for the general population. This leads to the first question of our article: Do low-income farmers use other safety net programs to maintain a minimum standard of living? We review two of these safety net programs, food stamps and Medicaid, and then compare the participation of farmers and the general population in these programs. For this analysis, we use the 1989–2004 March

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¹ We do not mean to imply that the only goal of farm support payments is the alleviation of poverty among farmers. There are numerous other goals including ensuring the food security of the United States and enhancing farm market performance.

Demographic Files from the Current Population Survey (CPS). If eligible farmers are utilizing food stamps and Medicaid at levels similar to the general population, this implies there is less need for farmer-specific safety net programs for low-income farmers.

While farm support payments do largely bypass low-income farmers, the loss of these payments may lead to more need for a safety net for low-to-middle income farmers who do receive farm support payments. So, our second question is: What would happen to the number of farmers eligible for general safety net programs if farm support payments were eliminated? To answer this question, we use the CPS augmented with information from studies using the Agricultural Resource Management Study (ARMS).

In answering these two questions, we inform three primary literatures. First, we contribute to the literature on program participation. While there is an extensive literature on the decision to enroll in the Food Stamp Program (Blank and Ruggles; Daponte, Sanders, and Taylor; Gundersen and Oliveira; Keane and Moffitt) and in Medicaid (Currie and Grogger, Currie and Gruber, Dubay and Kenney, Kaestner and Kaushal), the participation of farmers in these programs has not been studied.

Second, we contribute to the literature on poverty and participation in assistance programs in rural areas. (For recent work, see, e.g., Brown and Lichter; Kilkenny and Huffman; Weber, Edwards, and Duncan; Cotter; Jensen et al.; Jolliffe; McLaughlin; Slack and Jensen.) While agriculture does not play as large a role in rural areas as it once did, farmers continue to influence the rural poverty landscape and the departures of many former farmers have had enormous consequences for rural communities (Fitchen, especially chap. 3). For farmers contemplating leaving agriculture, general safety net programs may constitute enough support to enable farmers to stay in agriculture. Along with directly benefiting the farmers in these programs, the health of rural communities may be sustained due to the continuing presence of these farmers.

Third, we contribute to the literature which looks at farmers' interactions with the non-farm sector. There has been extensive research as it applies to issues such as the off-farm labor supply of farmers (e.g., Corsi and Findeis, Huffman 1980) and the connection between land for farming and land for alternative uses (e.g., Adelaja, Miller, and Taslim; Lockeretz). Given the emphasis in other areas on the

connection between the agricultural and non-agricultural sectors, the absence of research looking at the connection between farm and nonfarm safety nets is perhaps surprising.

We find that low-income farmers are much less likely than the general low-income eligible population to use the two largest safety nets available to the general population, the Food Stamp Program and Medicaid. The low participation rates of farmers can be ascribed to their status as farmers but the holding of multiple jobs is also a factor. If the farm safety net were eliminated, there would be an increase in the number of farm households eligible for food stamps but, given current participation levels among farm households, very little change in the number receiving food stamps.

Safety Net Programs for the General Population

In practice if not in intent, the U.S. farm safety net primarily benefits more well-off farmers. Even though farm programs largely bypass lower income farmers, these farmers may benefit from safety net programs designed for the general population making the concern regarding the distribution of farm safety net benefits less paramount. We now consider the participation of farmers in the Food Stamp Program and in Medicaid.

We have chosen to examine the Food Stamp Program because it is available to virtually the entire low-income population (other assistance programs like Temporary Assistance for Needy Families (TANF) are only for segments of this population); it can constitute a substantial portion of families' income; and benefit levels are inversely related to income rather than in a lump sum format.

In terms of total expenditures, Medicaid is far larger than the Food Stamp Program. In 2002, the combined federal and state contribution totaled 258.2 billion dollars for Medicaid in comparison to 21.9 billion dollars for food stamps. We have chosen to analyze Medicaid because, in contrast to food, farmers cannot provide their own medical care (unless they are also doctors or nurses) and because, in recent years, it has a higher income cutoff than the Food Stamp Program.²

² There are several other assistance programs in the United States where eligible recipients must take actions to receive benefits. Two of the larger programs in this category are Supplemental Security Income (SSI) and TANF. We do not analyze either of these programs due to the small number of farm households eligible for these programs.

The Food Stamp Program

The Food Stamp Program is the cornerstone of U.S. food assistance programs and, with a few exceptions, it is available to everyone who meet income and asset tests. To receive food stamps, households must meet three financial criteria: the gross-income test, the net-income test, and the asset test. A household's gross income before taxes in the previous month must be at or below 130% of the poverty line. Households headed by someone over the age of sixty years are exempt from this test, though they still face the other tests. In addition to the gross-income test, a household must have a net monthly income at or below the poverty line.³ Finally, income-eligible households with assets less than \$2,000 qualify for the program (\$3,000 for households headed by someone over sixty years of age). The value of a vehicle above \$4,650 is considered an asset unless it is used for work or for the transportation of disabled persons. Three assets which may be particularly relevant for farmers—the value of farmland, the value of a house, and the value of assets used for one's job—are not considered "assets" for the food stamp asset test. Households receiving TANF and households where all members receive SSI, are categorically eligible for food stamps and do not have to meet these three tests.

As is the case for the general population, many eligible farm households will choose not to participate in the Food Stamp Program, a decision often ascribed to three main factors. First, there may be stigma associated with food stamps. Stigma encompasses a wide variety of sources, from a person's own distaste for receiving food stamps to his or her desire to avoid disapproval from others when redeeming food stamps to the possible negative reaction of caseworkers (Ranney and Kushman, Moffitt). A person's own distaste may be especially strong among farmers (Fitchen, p. 27; Struthers and Bokemeier) and, in rural communities, the need to use food stamps in nearby stores where others in the community shop may make a farmer less willing to receive food stamps. Second, transaction costs increase the disadvantages to participation. These transaction costs include the amount of time to get

to the food stamp office and the time spent in those offices; the burden of taking children to the office or paying for child care services; and the availability and costs of transportation. To remain a participant, a household faces these costs on a repeated basis when it must recertify its eligibility. Because there are fewer Food Stamp Program offices in rural areas, these transaction costs may be especially relevant for farmers. Third, the benefit level may be too small to induce participation. Food stamp benefits can be as low as \$10 a month for a family. At higher benefit levels, the benefits to receiving food stamps may outweigh the stigma and transaction costs but this may not hold at lower levels.

In the farm population, there are at least three other reasons for nonparticipation. First, farmers have the ability to utilize their farm as a personal food source. If this food source is sufficiently large, the need for food stamps is correspondingly diminished. A second reason is related to workforce participation which, above and beyond its effect on income, leads to lower participation rates in the general population. As a consequence, we may expect lower participation rates for farmers due to their participation in the paid labor force. The third reason is associated with farmers presence in rural rather than urban areas. Research has demonstrated that persons living in nonmetropolitan areas (including farmers) maintain their standards of living through the use of barter, do-it-yourself work, and other informal activities. In a sample of nonmetropolitan residents in Wisconsin, the median value of these informal activities amounted to \$2,272, which is a substantial sum for low-income families (Larrivee). While some of this "income" will be counted as income and, hence, will lead to lower food stamp benefit levels, other activities (e.g., bartered services) are not counted as income. These other activities do, however, raise a family's living standards, lessening the need for food stamps.

Medicaid

Medicaid began as a joint federal and state program in 1965 and is now the largest source of funding for medical and health-related services for America's low-income population. Under federal guidelines, Medicaid recipients must have access to health-care services such as hospital services, prenatal care, vaccines for children, and rural health clinic services.

³ Net income is calculated by subtracting a standard deduction from a household's gross income. In addition to this standard deduction, households with earnings from the labor market deduct 20% of these earnings from their gross income. Deductions are also taken for child care and/or care for disabled dependents, medical expenses, and excessive shelter expenses.

In contrast to food stamps where the guidelines for eligibility are the same across all states (with a few exceptions), each state establishes its own Medicaid eligibility standards, definitions of available services, and rate of payment for services. As a consequence of this diversity, who is eligible for Medicaid also varies widely across states.⁴ The reasons for nonparticipation by farmers in Medicaid are similar to some of those found in food stamps—stigma, transaction costs, benefit levels relative to income, participation in the workforce, and “income” generated through informal activities. In addition, persons perception of their need for health care is a factor specific to the Medicaid-participation decision.

Data

The CPS is administered monthly by the Census Bureau for the Bureau of Labor Statistics to approximately 50,000 households. This nationally representative survey is the primary source of information on the U.S. labor force. In this article, we use data from the March Demographic Files from the CPS for the years 1989–2004. The questions in the survey refer to the previous year and so our analyses refer to the years 1988–2003.⁵ The March CPS is used to calculate the official poverty rates for the United States. In this article we rely on five primary groups of questions—food stamp participation; income; returns from assets; source of earnings; and demographic characteristics. We define a farm household as follows. In the CPS, each working age person is asked whether they have any income from farm self-employment. We characterize a “farm household” as a household where one or more persons respond affirmatively to this question.

For our primary analyses, we confine our sample to households with children. We do so because of the eligibility rules for Medicaid. While food stamps are available to virtually all income- and asset-eligible persons, Medicaid is generally restricted to families with children. For the sake of making comparisons across the two assistance programs, we restrict the sample to families with children in both cases.

We also restrict the sample to single-family households because the methods used to calculate eligibility for food stamps for multiple-family households are more complicated and cannot be identified in the CPS. As an example, if two families in a household eat meals together they are considered to be a “single family” when applying for food stamps but if they eat meals separately, they are considered to be separate families; when defining eligible households in the CPS, we would not know whether this multiple-family household should be counted as one family or two families. We do, however, consider the robustness of our results to our restrictions to single-family households with children.

We use the CPS because it is the only data source with a sufficient number of farmers, information about participation in food stamps and Medicaid, and the information needed to identify who is eligible for each program. In addition, since our empirical strategy is to ascertain the probability of receiving food stamps or Medicaid (after controlling for other factors), we need to use a data set with information on nonfarmers; the CPS has this information. The largest survey of farmers, the ARMS, does not contain information about participation in food stamps or Medicaid and it does not sample nonfarmers. The CPS has been used extensively in the program participation literature (recent work on the Food Stamp Program and Medicaid includes Currie and Gruber, Cutler and Gruber, Jolliffe et al.) and the rural poverty literature (recent work includes Slack and Jensen, Jolliffe) but it has been used less frequently to study issues about farm households (Gundersen et al., Huffman 1991, Tokle and Huffman).

One limitation of the CPS is that it does not have information on farm safety net payments. So, to answer the second question of this paper about the impact of losing farm safety net payments on the number of farmers eligible for food stamps, we impute information about government payments from analyses using the ARMS.⁶ The ARMS is conducted annually by the Economic Research Service and the National Agricultural Statistics Service in all states except Alaska and Hawaii. Approximately 15,000 farms and ranches (defined as establishments from which \$1,000 or more of agricultural products were sold or would normally be sold during the year)

⁴ There are some groups, however, that are eligible for Medicaid in all states, including TANF and SSI recipients; children under the age of six years and pregnant women with family income under 133% of the poverty line; children in families with incomes at or below the poverty line; and some Medicare recipients.

⁵ In general, a household is observed in two successive years in the March CPS. In response, we only include households the first time they are observed in the CPS.

⁶ The income from safety net payments is included in the CPS income figures so the lack of a breakdown for these specific payments does not affect our results.

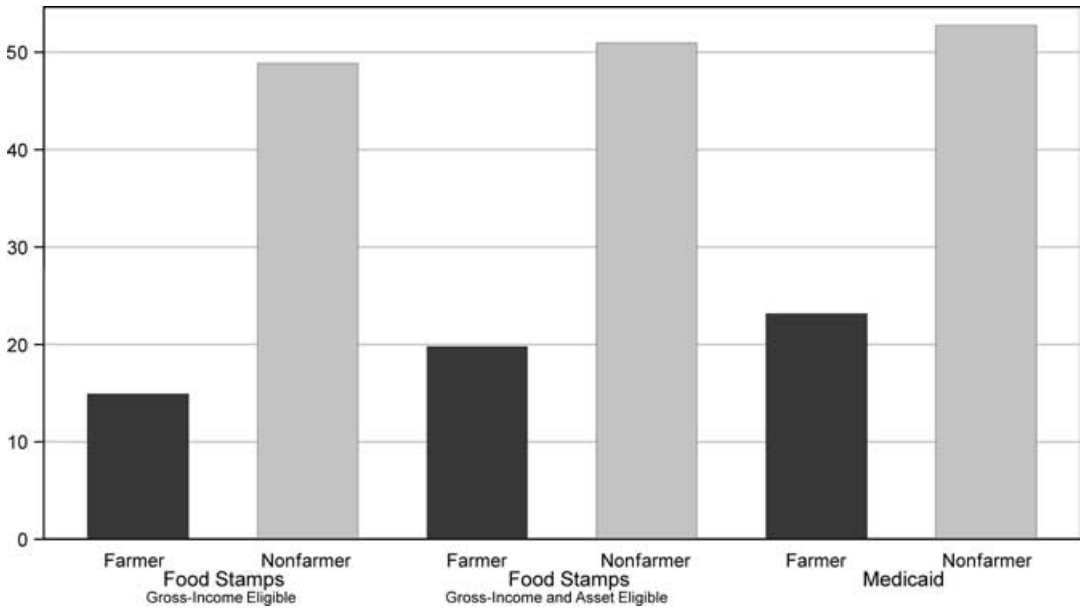


Figure 1. Food stamp and Medicaid participation rates, by farm self-employment status: 1988–2003

are contacted annually and their operators were personally interviewed. The ARMS is a probability-based survey in which each respondent represents a number of farms of similar size and type. Thus, sample data can be expanded using appropriate weights to represent all farms in the contiguous United States. (Papers using the ARMS to study issues about low-income farmers in the United States include Gundersen et al.; Hoppe, Perry, and Baker; Hoppe.)

Descriptive Statistics, Estimation Methods, and Results

Participation in Nonfarm Safety Net Programs

In figure 1, we compare the participation rates of farmers and nonfarmers in food stamps and Medicaid where the participation rate is defined as the ratio of households receiving benefits to eligible households. The Food Stamp Program has both income and asset tests for eligibility so we display participation rates under both criteria.⁷ Our Medicaid-eligible sample is based on each state's eligibility criteria. These

summary statistics are established by combining data from the years of our analyses, 1988–2003 (interview years, 1989–2004).

For both food stamps and Medicaid, participation rates are substantially lower for farmers in comparison to nonfarmers. Under either eligibility criteria, farmers are over 60% less likely to participate in food stamps. For Medicaid, the gap is slightly lower (56.1%). This gap is present in every year of our sample.

In table 1, we consider differences in demographic characteristics of farmers and nonfarmers as one possible explanation for the difference in participation rates in food stamps and Medicaid. In columns 1 and 2 of table 1, we compare food-stamp-eligible farmers and nonfarmers over several variables correlated with the probability of receiving food stamps. In comparison to nonfarmers, farm households are more likely to own their homes (on average, 63.6% of farmers are homeowners versus 29.0% of nonfarmers), are more likely to be married (81.2% versus 43.0%), are more likely to be high school graduates (85.7% versus 66.7%), and are more likely to have only white persons (76.4% versus 41.3%). These four characteristics have all been found to be associated with lower rates of participation in the Food Stamp Program (see, e.g., Keane and Moffitt, Gundersen and Oliveira). The high number of married farmers also renders them ineligible for one of the primary gateway programs for the Food Stamp Program, TANF.

⁷ We do not directly observe asset levels in the CPS. We do, however, observe the amount of dividend and interest income received by households in the past year. We assume a 5% return to these assets and therefore multiply the dividend plus interest income by twenty. We do not include the net income test. However, virtually all families meeting the gross income test also meet the net income test.

Table 1. Summary Statistics: Comparison of Farm and Nonfarm Households, 1988–2003

	Households Eligible for Food Stamps		Households Eligible for Medicaid	
	Farm Households	Nonfarm Households	Farm Households	Nonfarm Households
Total income/1,000	13.512** (0.351)	11.007 (0.038)	19.454** (0.495)	14.825 (0.058)
Homeowners	0.636** (0.024)	0.290 (0.0027)	0.712** (0.018)	0.341 (0.00260)
Number of children	2.473** (0.066)	2.248 (0.0073)	2.525** (0.0540)	2.314 (0.0068)
Married	0.812** (0.020)	0.430 (0.0029)	0.870** (0.013)	0.513 (0.0028)
High school graduate	0.857** (0.018)	0.667 (0.0028)	0.902** (0.012)	0.727 (0.0028)
White, non-Hispanic	0.764** (0.021)	0.413 (0.0030)	0.854** (0.014)	0.458 (0.0028)
Black, non-Hispanic	0.080** (0.014)	0.247 (0.0025)	0.043** (0.0080)	0.217 (0.0080)
Hispanic	0.100** (0.015)	0.286 (0.0027)	0.066** (0.0098)	0.266 (0.0025)
Age of household head	38.208** (0.441)	35.540 (0.062)	37.862** (0.055)	34.504 (0.055)
Wages or salary income	0.764** (0.021)	0.698 (0.0027)	0.774 (0.016)	0.753 (0.0024)
Self-employment income	0.345** (0.024)	0.078 (0.0016)	0.312** (0.019)	0.093 (0.0016)
Number of observations	399	28,767	660	32,089

Notes: Data are from a combined sample of eligible households in the survey years 1989–2004 from the March Demographic Files of the Current Population Survey. Standard errors are in parentheses. * or ** are used if the *p*-value of the difference between the variables are less than 0.05 or 0.01, respectively.

The differences between farm and nonfarm households in columns 3 and 4 (for Medicaid) of table 1 are similar although at generally higher levels of well-being because of the higher income cutoffs for Medicaid (e.g., rates of homeownership are higher in both farm and nonfarm households).

Alongside demographic differences, eligible farm households also have higher incomes than eligible nonfarm households. As noted above, food stamp benefits are inversely related to income and, therefore, households with higher incomes will receive lower benefits, making them less likely to receive food stamps. For food-stamp-eligible households, the average income of farm households is \$13,512 and for nonfarm households it is \$11,007. For Medicaid-eligible households with children, the figures are \$19,454 and \$14,825.

The employment status of eligible households is another determinant of food stamp participation. We use a binary variable to reflect whether income is received through wage and salary and/or through self-employment (other than farm self-employment) by at least

one person in the household. For food stamps, the percentage of households with wage and salary incomes is only slightly higher for farmers in comparison to nonfarmers. On average, 76.4% of food-stamp-eligible farm households and 69.8% of food-stamp-eligible nonfarm households have wage and salary incomes. For Medicaid-eligible households, the difference in the proportion of households receiving wage and salary incomes is statistically insignificant.

The story when it comes to nonfarm self-employment status is very different, however. Farm households are much more likely to have income from self-employment activities: 34.5% of food-stamp-eligible and 31.2% of Medicaid-eligible households have self-employment income. Contrast this with nonfarm households where the figures are 7.8% and 9.3%. When considering these employment figures, it should be noted that these farm households also have income from farm sources. The combination of on-farm and off-farm work activities leads to even more time pressures on farm households which may

correspond to greater difficulties in finding the time to complete the food stamp and Medicaid application processes.

Probit Estimations

We now consider the influence of being a farmer on the food stamp and Medicaid participation decisions after controlling for other factors. To do so we begin by estimating the following two models using probit maximum likelihood estimates methods⁸

$$(1) \quad \begin{aligned} \text{Food stamp}_i &= 1 \text{ if } \text{Food stamp}_i^* > 0 \\ \text{Food stamp}_i &= 0 \text{ otherwise} \\ \text{Food stamp}_i^* &= \beta^F \mathbf{X}_i + \alpha^F \text{FARM}_i \\ &\quad + \gamma^F \text{SELFEMP}_i \\ &\quad + \Psi^F \text{WAGESAL}_i \\ &\quad + \zeta^F \mathbf{Z}_i + \tau^F \mathbf{S}_i + e_{Fi} \end{aligned}$$

$$(2) \quad \begin{aligned} \text{Medicaid}_i &= 1 \text{ if } \text{Medicaid}_i^* > 0 \\ \text{Medicaid}_i &= 0 \text{ otherwise} \\ \text{Medicaid}_i^* &= \beta^M \mathbf{X}_i + \alpha^M \text{FARM}_i \\ &\quad + \gamma^M \text{SELFEMP}_i \\ &\quad + \Psi^M \text{WAGESAL}_i \\ &\quad + \zeta^M \mathbf{Z}_i + \tau^M \mathbf{S}_i + e_{Mi} \end{aligned}$$

where \mathbf{X} is a vector of covariates reflecting economic and noneconomic factors; $\text{FARM} = 1$ if a household has some earnings from farm self-employment, 0 otherwise; $\text{SELFEMP} = 1$ if a household has some earnings from self-employment, 0 otherwise; $\text{WAGESAL} = 1$ if a household has some earnings from wages or salary, 0 otherwise; e_F and e_M are error terms; and i denotes a household. As done in figure 1 and table 1, we combine data from the years 1988–2003. Because multiple years are used, our model includes year fixed effects (\mathbf{Z}). These fixed effects are especially important to control for the major changes in welfare programs that occurred with the passing of the Personal Responsibility and Work Opportunity

Reconciliation Act in 1996. (For more on the implication of this change for the Food Stamp Program see Ziliak, Gundersen, and Figlio.) There is also extensive geographical variation across the country, which may be especially relevant for farmers. To control for this variation, we include a vector of state fixed effects (\mathbf{S}). In our first set of estimations of (1) and (2), we restrict our sample to families with children. (Below we consider the robustness of our results to this sample restriction.) In our estimations of (1), we restrict our sample to families (a) income and (b) income and asset eligible for food stamps. In our estimations of (2), our sample is restricted to families eligible for Medicaid. The results are in table 2. While all coefficients are displayed, we concentrate on the farm status and other employment status variables.

In comparison to nonfarm households, farm households are less likely to participate in both food stamps and Medicaid. Other households with earners are also less likely to participate in both programs. As noted above, farmers are about as likely as nonfarmers to have income from wage or salaried jobs and are more likely to have income from self-employment. To ascertain the effects of these multiple job sources, we simulate the probability of food stamp and Medicaid participation under several different scenarios about employment status. Formally, we simulate

$$(3) \quad \begin{aligned} \text{Food stamp}_{\text{NW}}^* &= \beta^F \bar{\mathbf{X}} + \zeta^F \bar{\mathbf{Z}} + \tau^F \bar{\mathbf{S}} \\ \text{Food stamp}_F^* &= \beta^F \bar{\mathbf{X}} + \alpha^F + \zeta^F \bar{\mathbf{Z}} \\ &\quad + \tau^F \bar{\mathbf{S}} \\ \text{Food stamp}_{\text{FSE}}^* &= \beta^F \bar{\mathbf{X}} + \alpha^F + \gamma^F \\ &\quad + \zeta^F \bar{\mathbf{Z}} + \tau^F \bar{\mathbf{S}} \\ \text{Food stamp}_{\text{FWS}}^* &= \beta^F \bar{\mathbf{X}} + \alpha^F + \Psi^F \\ &\quad + \zeta^F \bar{\mathbf{Z}} + \tau^F \bar{\mathbf{S}} \\ \text{Food stamp}_{\text{FSEWS}}^* &= \beta^F \bar{\mathbf{X}} + \alpha^F + \gamma^F \\ &\quad + \Psi^F + \zeta^F \bar{\mathbf{Z}} + \tau^F \bar{\mathbf{S}} \end{aligned}$$

where bars indicate mean values. The coefficients are those estimated in equation (1). Using the point estimates for each of the five equations, we then establish the probability of each participation decision. We do the same for Medicaid with the coefficients estimated in equation (2). All these results are in the bottom half of table 2.

The average household with no employment has a 59.29% probability of receiving food

⁸ We use this model solely to help us understand the influence of being in a farm household on the probability of food stamp participation. For models where the food stamp participation decision is explicitly being modeled, see, e.g., Blank and Ruggles, Keane and Moffitt. For several reasons, the CPS is not an ideal data set to explicitly model the food stamp participation decision. However, other data sets do not have enough farmers.

Table 2. Determinants of Assistance Program Participation by Eligible Households, Probit Models

	Food Stamp Participation		
	Gross-Income Test	Gross-Income and Asset Test	Medicaid
Income from farm self-employment	-0.624 (0.068)	-0.505 (0.076)	-0.415 (0.059)
Earnings from wages or salary	-0.403 (0.019)	-0.430 (0.020)	-0.554 (0.021)
Self-employed	-0.500 (0.029)	-0.506 (0.032)	-0.372 (0.027)
Total income/1,000	-0.029 (0.002)	-0.031 (0.002)	-0.022 (0.001)
Homeowners	-0.480 (0.019)	-0.449 (0.019)	-0.405 (0.018)
Number of children	0.201 (0.007)	0.208 (0.007)	0.116 (0.007)
Married	-0.357 (0.018)	-0.347 (0.019)	-0.305 (0.018)
High school graduate	-0.190 (0.018)	-0.163 (0.018)	-0.222 (0.019)
Black, non-Hispanic	0.187 (0.022)	0.153 (0.023)	0.212 (0.022)
Hispanic	-0.080 (0.023)	-0.110 (0.024)	0.048 (0.022)
Other, non-Hispanic	0.029 (0.035)	0.008 (0.036)	0.086 (0.033)
Age of household head	-0.010 (0.001)	-0.009 (0.001)	-0.013 (0.001)
Number of observations	31,387	29,166	32,736
Log-likelihood	-17,892.73	-16,785.59	-18,686.01
Likelihood ratio	7,686.29	6,524.65	7,947.56
Pseudo R^2	0.176	0.169	0.175
Probability of receipt (at average levels for other variables)			
No employment	59.29	61.86	66.70
Farmer	39.26	45.53	53.71
Farmer with wage income	27.39	32.09	36.03
Farmer with self-employment income	24.83	29.88	41.70
Farmer with both self-employment and wage income	15.64	18.91	25.47

Notes: Data are from a combined sample of eligible households in the survey years 1989–2004 from the March Demographic Files of the Current Population Survey. The sample is restricted to single-family households with children. Standard errors are in parentheses. The coefficients on the state and year fixed effects are suppressed in this table.

stamps. (This and subsequent discussions are for the gross-income eligibility criteria.) If the average household had farm self-employment income but no other sources of income, this drops by 20 percentage points. If the average household had farm self-employment income, some other self-employment income, and wage and salary income, the probability of food stamp receipt falls to 15.64%. For Medicaid, the drops are still present but are lower in magnitude. This is one indication that farmers may have more need for medical care and/or attach less stigma to the receipt of Medicaid in comparison to food stamps.

Bivariate Probit Estimations

A high proportion of families with children which are eligible for food stamps are also eligible for Medicaid and a high proportion of these families participate in both programs. In our sample, out of families eligible for both programs, 43.67% participate in both programs versus 6.94% and 15.54% for food stamps alone or Medicaid alone. (If we just impose the gross-income criteria, the figures are 45.90%, 7.01%, and 15.55%.) We may therefore expect there to be a high correlation in the error terms of equations (1) and (2) mentioned above. To

improve the efficiency of our parameter estimates we therefore estimate these equations jointly now allowing the error terms, e_F and e_M , to have nonzero correlation, ρ .

In order to estimate the bivariate probit model, we need to restrict our sample to families which are eligible for both food stamps and Medicaid. This reduces our sample size viz. the results in table 2. As in table 2, we restrict our sample to families with children.

Despite the different sample, the coefficient on farm self-employment remains negative and highly statistically significant for both food stamps and Medicaid (table 3). The coefficients for the other employment variables are also similar to those found in table 2. As seen in the values of ρ , there is a strong positive correlation between food stamp and Medicaid program participation.

Alternative Specifications

In our preferred model, we restrict our sample to households eligible for food stamps and/or Medicaid which contain (a) children and (b) one family. We now consider how our estimates of the effects of being in a farm household might differ if we relax these restrictions. We therefore reestimate equations (1) and (2) with these new samples, resimulate equation (3), and reestimate the bivariate probit models. The results are in tables 4 and 5.

Before turning to our results, we display the participation rates of farmers and non-farmers in these new samples in figures 2 and 3. These are akin to those found in figure 1. (Because most families without children are ineligible for Medicaid, we do not estimate models for this category and, consequently, the

Table 3. Determinants of Assistance Program Participation by Households Eligible for Both Food Stamps and Medicaid, Bivariate Probit Models

	Gross-Income Test		Gross-Income and Asset Test	
	Food Stamp Program	Medicaid	Food Stamp Program	Medicaid
Income from farm self-employment	-0.597 (0.075)	-0.506 (0.070)	-0.516 (0.085)	-0.399 (0.080)
Earnings from wages or salary	-0.416 (0.022)	-0.581 (0.022)	-0.440 (0.023)	-0.619 (0.023)
Self-employed	-0.491 (0.033)	-0.436 (0.031)	-0.496 (0.035)	-0.454 (0.034)
Total income/1,000	-0.024 (0.002)	-0.007 (0.002)	-0.025 (0.002)	-0.009 (0.002)
Homeowners	-0.464 (0.021)	-0.417 (0.020)	-0.432 (0.022)	-0.378 (0.021)
Number of children	0.188 (0.008)	0.098 (0.007)	0.193 (0.008)	0.102 (0.008)
Married	-0.435 (0.020)	-0.379 (0.020)	-0.423 (0.021)	-0.368 (0.021)
High school graduate	-0.178 (0.020)	-0.218 (0.020)	-0.152 (0.020)	-0.189 (0.021)
Black, non-Hispanic	0.178 (0.025)	0.198 (0.025)	0.142 (0.025)	0.162 (0.026)
Hispanic	-0.079 (0.025)	0.011 (0.025)	-0.112 (0.026)	-0.032 (0.026)
Other, non-Hispanic	0.042 (0.038)	0.056 (0.037)	0.019 (0.040)	0.023 (0.039)
Age of household head	-0.011 (0.001)	-0.014 (0.001)	-0.010 (0.001)	-0.013 (0.001)
Rho	0.743		0.742	
Likelihood ratio test (Rho = 0)	5,784.64		5,383.81	
Number of observations	25,314		23,656	
Log-likelihood	-25,978.575		-24,276.044	

Notes: Data are from a combined sample of eligible households in the survey years 1989–2004 from the March Demographic Files of the Current Population Survey. The sample is restricted to single-family households with children. Standard errors are in parentheses. The coefficients on the state and year fixed effects are suppressed in this table.

Table 4. Effect of Work Status on the Participation of Eligible Households, Alternative Specifications

	Food Stamp Participation		
	Gross-Income Test	Gross-Income and Asset Test	Medicaid
Single-Family Households (with or without Children)			
Income from farm self-employment	-0.619 (0.058)	-0.550 (0.066)	
Earnings from wages or salary	-0.385 (0.014)	-0.414 (0.015)	
Self-employed	-0.452 (0.024)	-0.472 (0.026)	
Number of observations	73,505	63,342	
Log-likelihood	-37,727.29	-34,631.66	
Likelihood ratio	16,594.75	13,436.76	
Pseudo R^2	0.180	0.162	
Probability of receipt (%)			
No employment	38.25	43.15	
Farmer	21.19	26.50	
Farmer with wage income	13.45	16.73	
Farmer with self-employment income	12.23	15.59	
Farmer with self-employment and wage income	7.24	8.98	
All Households with Children			
Income from farm self-employment	-0.614 (0.064)	-0.499 (0.072)	-0.422 (0.061)
Earnings from wages or salary	-0.398 (0.018)	-0.424 (0.019)	-0.550 (0.021)
Self-employed	-0.473 (0.027)	-0.477 (0.029)	-0.355 (0.026)
Number of observations	36,113	33,595	34,416
Log-likelihood	-21,000.30	-19,679.35	-20,029.10
Likelihood ratio	8,041.53	7,199.39	7,352.29
Pseudo R^2	0.1607	0.154	0.155
Probability of receipt (%)			
No employment	59.95	62.43	61.12
Farmer	39.83	45.98	56.07
Farmer with wage income	27.82	32.45	38.00
Farmer with self-employment income	25.75	30.86	44.28
Farmer with self-employment and wage income	16.30	19.65	27.40

Notes: Data are from a combined sample of eligible households in the survey years 1989–2004 from the March Demographic Files of the Current Population Survey. The other covariates in this model are income, family structure, race/ethnicity, high school graduation status, homeownership status, and year and state fixed effects.

results are not displayed in figure 2.) The gap between farmers and nonfarmers are similar in figure 2. The lower food stamp participation rates in comparison to figure 1 is due to the lower participation rates of families without children.

As seen in columns 1 and 2 of table 4, the effect of being in a farm household is statistically the same even after we expand the sample to include families without children. (The other covariates in the model are the same as those in table 2 but are suppressed here.) In addition,

the effects of other earnings sources are similar. In the bottom panel of table 4, one finds our results for the sample of households with multiple families with children.⁹ As was the case when the sample is expanded to include households without children, our results when our sample is expanded to include households

⁹ For households eligible for food stamps, 6.9% of farm households contain multiple families versus 13.2% of nonfarm households.

Table 5. Determinants of Assistance Program Participation by Households Eligible for Both Food Stamps and Medicaid, Bivariate Probit Models, Alternative Specifications (All Households with Children)

	Gross-Income Test		Gross-Income and Asset Test	
	Food Stamp Program	Medicaid	Food Stamp Program	Medicaid
Income from farm self-employment	−0.680 (0.077)	−0.493 (0.071)	−0.580 (0.086)	−0.374 (0.081)
Earnings from wages or salary	−0.425 (0.022)	−0.578 (0.023)	−0.449 (0.023)	−0.620 (0.024)
Self-employed	−0.466 (0.032)	−0.410 (0.030)	−0.469 (0.034)	−0.417 (0.033)
Rho	0.738		0.735	
Likelihood ratio test (Rho = 0)	5,959.33		5,516.97	
Number of observations	26,385		24,759	
Log-likelihood	−27,305.28		−25,544.28	

Notes: Data are from a combined sample of eligible households in the survey years 1989–2004 from the March Demographic Files of the Current Population Survey. Standard errors are in parentheses. The other covariates in this model are income, family structure, race/ethnicity, high school graduation status, homeownership status, and year and state fixed effects.

with multiple families remain statistically unchanged. In table 5, we display the results for the bivariate probit model estimated for the food stamp and Medicaid participation decisions for households with multiple families. As seen, the results are similar to those found in table 3. Overall, our results appear to be robust to sample choice.

Participation in Nonfarm Safety Nets in the Absence of Farm Safety Net Payments

Both the percent of eligible farmers and the participation rates for farmers in the general safety net are substantially lower than for the entire population; a result that holds even after controlling for other factors. We now consider

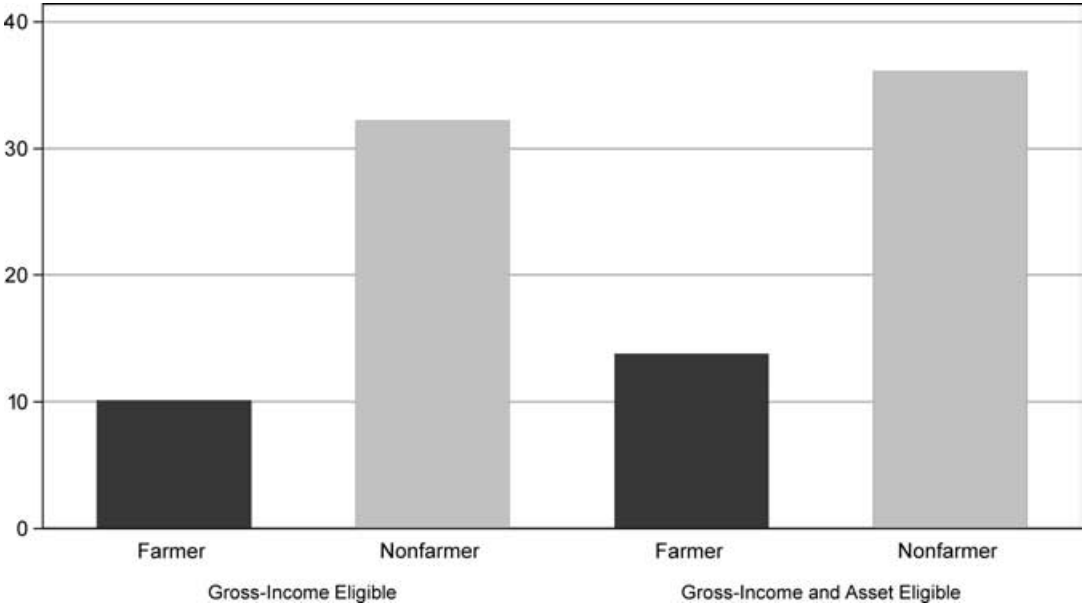


Figure 2. Food stamp participation rates, by farm self-employment status, all families: 1988–2003

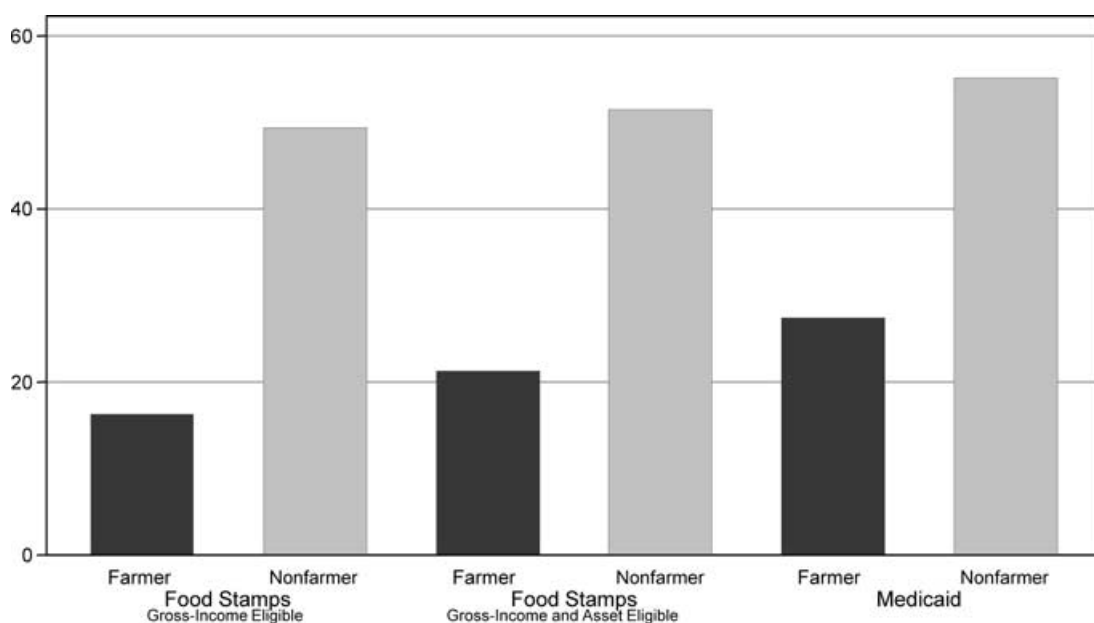


Figure 3. Food stamp and Medicaid participation rates, by farm self-employment status, including multiple family households: 1988–2003

how the number of farmers eligible for food stamps would change if the farm safety net were eliminated.

Previous research (Mishra et al., McElroy et al.) has divided farms into four categories: farmers with incomes and assets higher than the median nonfarm household (high income/high assets), high income/low assets, low income/high assets, and low income/low assets. The first two categories would not be eligible for food stamps or Medicaid, even if these households lost large amounts of farm government payments so we disregard them in the following analysis. The other two categories, however, contain potentially eligible households. Within each of these four categories for 2000 and 2001, Mishra et al. and McElroy et al. establish the average farm safety net payment. (The safety net payments include fixed direct payments, countercyclical payments, loan deficiency payments, and marketing loan gains.) For the two categories relevant here, the figures are as follows. In 2000, the average farm safety net payment to farmers in the low-income/low asset category was \$3,523 and in the low-income/higher wealth category, the average payment was \$6,115. In 2001, the corresponding figures are \$2,088 and \$6,023.

In the following simulations, we assume all households with incomes below the median income for the entire population will receive some farm support payment between these

two values in 2000 and 2001. In our simulations, we use (a) the lowest figures; (b) a figure midway between the two; and (c) the highest figures. Formally, within these three categories, we define a family's income without farm support payments as

$$\begin{aligned}
 (4) \quad \text{INCWFS}_{ji} &= \text{CI}_{ji} - \text{LOW} \\
 \text{INCWFS}_{ji} &= \text{CI}_{ji} - \text{MID} \\
 \text{INCWFS}_{ji} &= \text{CI}_{ji} - \text{HIGH}
 \end{aligned}$$

where CI denotes current income (as defined in the CPS); LOW denotes the low-end estimate of farm support payment; MID denotes the midway estimate of farm support payment; HIGH denotes the high-end estimate of farm support payments; and j denotes the year. A family is said to be eligible for food stamps if INCWFS is less than or equal to 130% of the poverty line. For the sake of simplicity, we presume that a loss of these payments would entail no loss of assets.¹⁰ We then calculate the new food stamp eligibility rates for farm households. (Constraints in sample size preclude the disclosure of the location of farms in

¹⁰ In reality, this is unlikely to be the case insofar as farm support payments are an important factor in the calculation of land values. As land values decrease, this may also lead to a decline in liquid assets. The extent of such a decline is difficult to predict so we presume that there is no change.

Table 6. Eligibility Rates for the Food Stamp Program for Farm Households with and without Farm Safety Net Payments

	2000	2001
	With Farm Safety Net Payments	
Passing gross-income test	13.3	13.5
Passing gross-income and asset tests	9.8	10.3
	Without Farm Safety Net Payments—Low-End Estimates	
Passing gross-income test	16.2	15.2
Passing gross-income and asset tests	12.0	11.4
	Without Farm Safety Net Payments—Midway Estimates	
Passing gross-income test	18.4	16.5
Passing gross-income and asset tests	13.7	12.3
	Without Farm Safety Net Payments—High-End Estimates	
Passing gross-income test	20.1	18.2
Passing gross-income and asset tests	15.0	13.3

Notes: Simulations are based on data from the March Demographic Files of the Current Population Survey (CPS). The amount of safety net payments received by farmers in the three categories is derived from Mishra et al. and McElroy et al.

the ARMS and this prevents us from making simulations for Medicaid, where there is substantial variation in state-level eligibility criteria.) Our results are found in table 6.

Concentrating on the results for gross-income and asset-eligible households with children, in 2001 a loss of farm support payments would lead to a 1.1 percentage point increase in the number of farm households eligible for food stamps (from 10.3% to 11.4%) if the low-end estimates are used. The figures are 2.0 and 3.0 percentage points for the midway and high-end estimates, respectively. In 2000, the figures are 2.2 (from 9.8% to 12.0%), 3.9, and 5.2 percentage points, respectively.

There are about 1.5 million farm households with children in the United States. As a consequence, loss of farm support payments would have resulted in up to 45,000 more households eligible for food stamps in 2001 and 75,000 more households eligible in 2000. The eligibility rates for farmers would still be below those for the population as a whole, even if we assumed the loss of farm safety net payments was over \$6,000 (our high-end estimate). Under the assumption that there is no change in the participation rate among farmers, the increase in the number of farm households receiving food stamps would be very small.

For any of our estimates of the loss of farm support payments (i.e., the low, high, or midway estimates), the increase in the number of farm households eligible for food stamps

should be seen as an upper bound insofar as, in the absence of farm support payments, farmers would presumably make changes in their farm operations, their off-farm labor supply, or both in response to the loss of farm support payments. Presumably, these responses would allow at least some farmers to remain above the income cutoff for food stamps.

While we have overstated the increase in the number of farm households who would become eligible for food stamps, the loss of farm support payments has implications for program participation beyond their direct impact on farm households. If farm support payments were to end, this would also necessitate changes in the farm operations of middle- and upper-income farmers. Possible changes include a decline in wages for farm workers and a decline in payments to others in rural communities since at least some of the rents accorded to farmers through farm support payments are passed on to these two groups. These decreases in wages and other payments may lead to an increase (at least in the short term) in the number of families eligible for social support programs designed for the general population. While these general equilibrium effects of farm support payments are beyond the scope of this article, future research may wish to consider these effects and incorporate them into any complete discussion about the costs and benefits associated with the farm safety net.

Conclusion

Poverty in farm households is no longer the pervasive problem that it was in Depression-era rural America. The availability of off-farm employment, productivity gains in agriculture, and policies to support farm incomes have all to one degree or another created prosperity for most American farm families. Still, about 10% of farm households have incomes below the poverty line. Previous research finds that existing farm programs, which distribute benefits based on volume of commodity produced, provide poor farm households, whose farm operations tend to be small, with lower payments than their larger, better-off counterparts. The contemporary farm safety net does not therefore provide a guarantee against poverty.

To preserve a minimum standard of living, one strategy for these poor farm households might be to participate in the safety net for the general population, in particular, two of the largest assistance programs—food stamps and Medicaid. However, we find that eligible farm households participate at substantially lower rates in both programs than do eligible non-farm households. This relationship holds after controlling for other factors. In addition to the influence of being a farm household, the high percentage of farm households with other sources of income further limits their probability of participating. If a goal of policymakers is to increase participation in these programs among farmers, our results indicate that one approach may be to ensure the employment commitments of farmers not interfere with their ability to apply for food stamp and Medicaid benefits. For example, having office hours which do not coincide with the usual working day may help meet this goal.

While farm safety net programs do largely bypass low-income farmers, their absence would lead to changes in the numbers of lower-middle income farm households eligible for food stamps. We find that there would likely be a nontrivial increase in the number of farm households eligible for food stamps in the absence of safety net programs. This potential increase in the number of eligible households implies that the need for policies to address the low participation rates of farmers would be relevant for a wider group of households.

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